**AS Unit 1: Basic Biochemistry and Cell Organisation**

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| Name: | Date: |

**Topic 1.2 Cell Structure and Organisation – Page 3**

l. **Eukaryotic Cells**

**i.) Under the electron microscope**

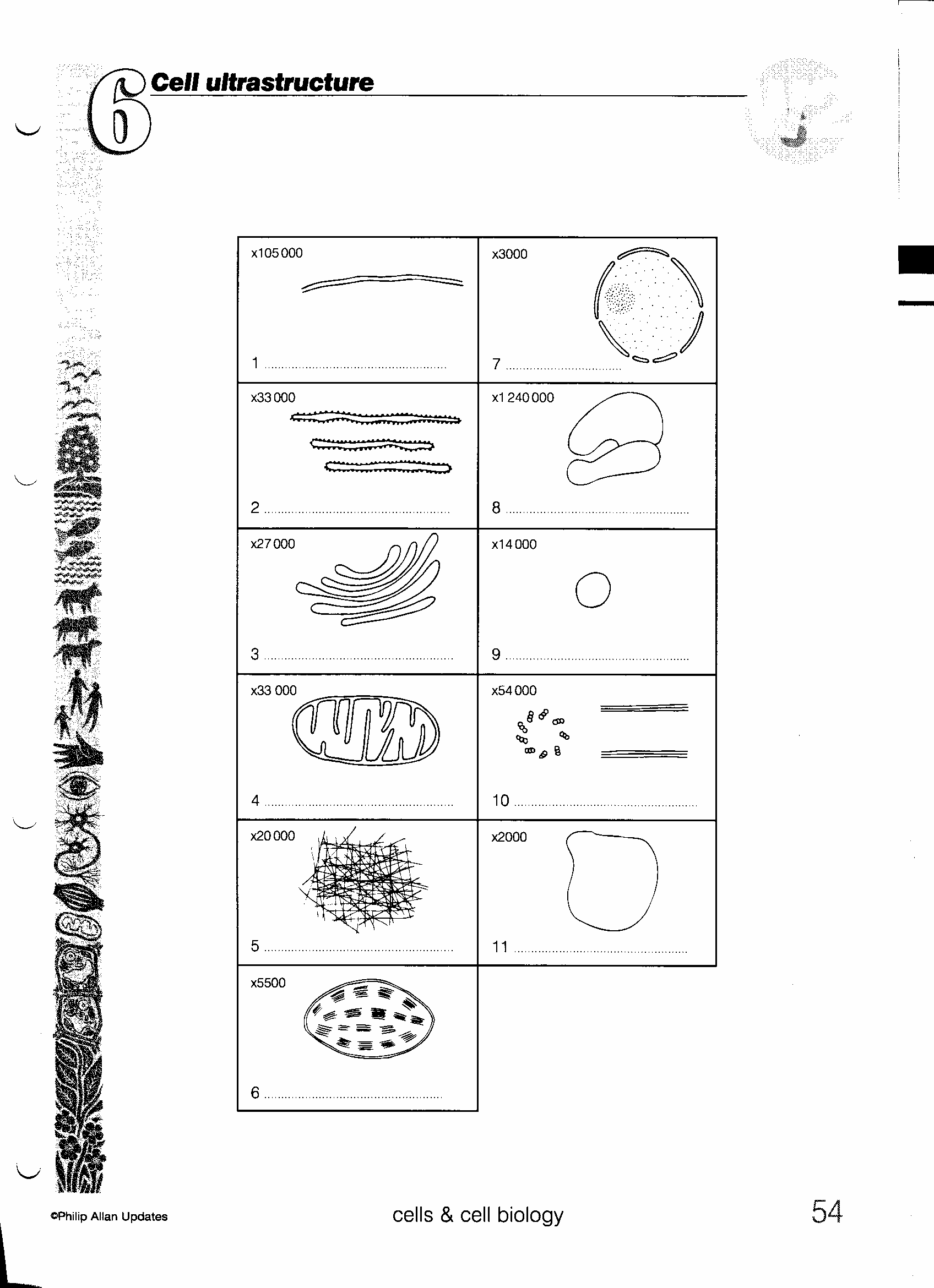
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|  |  | Completed |
| 1. | Read about the detailed structure of eukaryotic cells as seen under the electron microscope.   * Rowlands p.26-30 * Handout **1.2e** (animal cell ultrastructure and a typical plant cell) * Go through the PowerPoint ‘**Eukaryotic Cells – Under the electron microscope’ and ‘A – Introduction to Cells’** |  |
| 2. | Answer the following questions:   1. What is the ‘**ultrastructure**’ of a cell? 2. What is an **organelle**? 3. What is meant by the term ‘**internal cell membrane’**? 4. List in a table those organelles surrounded by a membrane and those that are not. 5. What are the advantages to a cell of having organelles? In particular what are the advantages of membrane bound organelles. |  |
| 3. | Complete the activity on sheets **1.2f Cell Ultrastructure** |  |

**W/S 1.2f Cell Ultrastructure**

You will need to use your textbook and the Internet to help you with the following task:

Below are some organelles, which are commonly found in animal cells.

* Find out the name of each and write the name in the box next to the organelle.
* Cut out all the boxes and keep them safe.



**W/S 1.2f Cell Ultrastructure**

Below are some boxes, which give details about the structure and functions of the organelles you have cut out previously.

* Cut them out and match your picture of the organelle with their structure and function.
* Construct a table using your pieces of paper showing the organelles along with their structure and function.

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| Large organelle enclosed by a double membrane (an envelope) perforated by pores. Contains chromosomes and one or more nucleoli. | Very small organelle not bounded by a membrane. Consists of a large and a small subunit. Made of protein and RNA. |
| Stack of membrane-bounded, flattened sacs in cytoplasm, looking like a pile of pitta bread. | Form a spindle-shaped structure of protein fibres on which the chromosomes move during nuclear division. |
| A partially permeable barrier, which controls the passage of substances into and out of the cell. | Chromosomes contain DNA, which controls the synthesis of proteins. Ribosomes are formed in the nucleolus. |
| Provides mechanical support and protection. Prevents cell from bursting. | A pair of short cylinders. Each cylinder is made up of nine fibres. |
| The site of aerobic respiration and responsible for producing most of the ATP in a cell. | A sac bounded by a single membrane. Contains cell sap, which is a solution of mineral salts, pigments, organic acids and other substances. |

**W/S 1.2f Cell Ultrastructure**

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| Forms a system of channels for transporting materials through the cytoplasm. One type has ribosomes on its surface and is the site of protein synthesis. The other type has no ribosomes and is where steroids and other lipids are synthesized. | Receives proteins synthesized on the ER and prepares them for secretion from the cell. This often involves adding carbohydrate to the proteins to make them into glycoproteins. |
| Responsible for destroying worn out organelles and for digesting the contents of vacuoles formed by phagocytosis. | Contains an outer membrane and an inner one which is folded to form cristae. Inside the inner membrane is the matrix containing enzymes, a circular DNA molecule and ribosomes. |
| A phospholipid bilayer with intrinsic and extrinsic proteins. | Consists of cellulose microfibrils and other polysaccharides. |
| Surrounded by two membranes. Contains a matrix called stroma which has a system of membranes running through it. These are stacked to form grana containing chlorophyll. Stroma contains circular DNA, ribosomes and starch grains. | A vesicle containing digestive enzymes. |
| A complex network of flattened membrane-bounded sacs called cisternae. Often has ribosomes on the cytoplasmic side. | The organelle in which photosynthesis takes place. Pigments capture the energy of sunlight and transfer it to chemical bonds. |
| Stores waste products and other substances. Changes in volume affect the turgidity of the cell. | Uses the information in nucleic acid to synthesise proteins. |

**W/S 1.2f Cell Ultrastructure**

Using the summary chart and a textbook to help you answer the following questions:

1. Write a simple definition for each of the following words. Try to write the definition using your own words rather than just copying from a book or Internet.

a. Plasma membrane

b. Membrane

c. Chromosome

d. Partially permeable

e. Synthesis

f. Aerobic respiration

g. ATP

h. Polysaccharide

i. Matrix

j. Secretion

k. Vesicle

l. Microfibril\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Extension**

Construct a dichotomous key, based on structural differences, to identify the organelles you identified in your table.